

-continued

1025

## (2) INFORMATION FOR SEQ ID NO:5:

- (1) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 20 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(11) MOLECULE TYPE: DNA (primer)

(x1) SEQUENCE DESCRIPTION: SEQ ID NO:5:

GCAAGGAGGG TTTGTCACTG

20

## (2) INFORMATION FOR SEQ ID NO:6:

- (1) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 23 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(11) MOLECULE TYPE: DNA (primer)

(x1) SEQUENCE DESCRIPTION: SEQ ID NO:6:

CCGATTCCAC TGTAGTGTTA GCC

23

## (2) INFORMATION FOR SEQ ID NO:7:

- (1) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 20 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(11) MOLECULE TYPE: DNA (primer)

(x1) SEQUENCE DESCRIPTION: SEQ ID NO:7:

TAACACTACA GTGGAATCGG

20

## (2) INFORMATION FOR SEQ ID NO:8:

- (1) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 20 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(11) MOLECULE TYPE: DNA (primer)

(x1) SEQUENCE DESCRIPTION: SEQ ID NO:8:

AAATCCAGGC AGAGCACGAG

20

## (2) INFORMATION FOR SEQ ID NO:9:

- (1) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 24 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(11) MOLECULE TYPE: DNA (primer)

(x1) SEQUENCE DESCRIPTION: SEQ ID NO:9:

TGCTCGTGCT CTGCCTGGAT TTCC

24

## (2) INFORMATION FOR SEQ ID NO:10:

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( i ) SEQUENCE CHARACTERISTICS:  
 ( A ) LENGTH: 24 base pairs  
 ( B ) TYPE: nucleic acid  
 ( C ) STRANDEDNESS: single  
 ( D ) TOPOLOGY: linear

( i i ) MOLECULE TYPE: DNA (primer)

( x i ) SEQUENCE DESCRIPTION: SEQ ID NO:10:

ATTGAATGGT CATTGACATG AGAC

24

( 2 ) INFORMATION FOR SEQ ID NO:11:

( i ) SEQUENCE CHARACTERISTICS:  
 ( A ) LENGTH: 12 amino acids  
 ( B ) TYPE: amino acid  
 ( C ) STRANDEDNESS: single  
 ( D ) TOPOLOGY: linear

( i i ) MOLECULE TYPE: peptide

( x i ) SEQUENCE DESCRIPTION: SEQ ID NO:11:

Cys Xaa Xaa Cys Xaa Xaa Cys Xaa Xaa Xaa Cys Xaa  
 1 5 10

( 2 ) INFORMATION FOR SEQ ID NO:12:

( i ) SEQUENCE CHARACTERISTICS:  
 ( A ) LENGTH: 12 amino acids  
 ( B ) TYPE: amino acid  
 ( C ) STRANDEDNESS: single  
 ( D ) TOPOLOGY: linear

( i i ) MOLECULE TYPE: peptide

( x i ) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Cys Xaa Xaa Cys Xaa Xaa Cys Xaa Xaa Xaa Cys Pro  
 1 5 10

( 2 ) INFORMATION FOR SEQ ID NO:13:

( i ) SEQUENCE CHARACTERISTICS:  
 ( A ) LENGTH: 17 amino acids  
 ( B ) TYPE: amino acid  
 ( C ) STRANDEDNESS: single  
 ( D ) TOPOLOGY: linear

( i i ) MOLECULE TYPE: peptide

( x i ) SEQUENCE DESCRIPTION: SEQ ID NO:13:

Val Xaa Val Xaa Gly Xaa Gly Xaa Xaa Gly Xaa Xaa Xaa Ala Xaa Xaa  
 1 5 10 15

Ala

What is claimed is:

1. An isolated nucleic acid encoding a dihydropyrimidine dehydrogenase (DPD) protein wherein the nucleic acid selectively hybridizes, under stringent hybridizing conditions, to a second nucleic acid consisting of the nucleotide sequence of Seq. ID No. 1 or Seq. ID No. 3 or an isolated nucleic acid which encodes seq ID Nos:2 or 4.

2. The nucleic acid of claim 1 wherein the nucleic acid is of human origin.

3. The nucleic acid of claim 2 wherein the nucleic acid consists of the nucleotide sequence of Seq. ID. No.1.

4. The nucleic acid of claim 1 wherein the nucleic acid is of pig origin.

5. The nucleic acid of claim 4 wherein the nucleic acid consists of the nucleotide sequence of Seq. ID. No.3.

6. The nucleic acid of claim 1 wherein the nucleic acid is full-length.

7. An isolated oligonucleotide probe that selectively hybridizes, under stringent hybridizing conditions, to SEQ ID NO:1 or 3, wherein said probe does not selectively hybridize, under stringent hybridizing conditions, to a non-DPD nucleic acid.

8. An oligonucleotide probe of claim 7 that is between about 10 and 100 nucleotides in length.

9. An expression vector comprising a selectable marker, wherein the selectable marker is a nucleic acid of claim 1.

59

10. An expression vector as in claim 9 wherein the selectable marker is operably linked to at least one promoter.

11. An expression vector as in claim 10 wherein the promoter functions in a eukaryote.

12. An expression vector as in claim 10 wherein the promoter functions in a prokaryote.

60

13. An expression vector as in claim 10 wherein the selectable marker is operably linked to both a prokaryotic and a eukaryotic promoter.

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